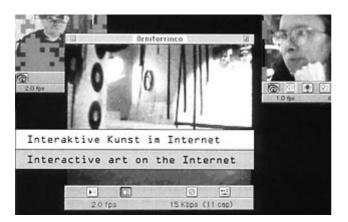# Interactive Art On The Internet
Eduardo Kac

The Internet is a worldwide network which links more than three million computers in more than three dozen countries (http://www.w3.org/hypertexUDataSources/WWW/Servers.html), and connects millions of people from backgrounds as diverse as the academy, business, military, and the arts. This huge network configures an absolutely new situation in the arts, enabling artists to help define an emerging social and cultural process and prompting reflection on its impact and potential. The goal of this essay is to map some of the interactive artistic developments currently taking place on the Internet and to spotlight the unique aesthetic investigations made possible by this seamlessly integrated worldwide computer network. The essay is structured with references to material that can be immediately accessed on the Internet. In this sense, this essay is itself an experiment in linking the Internet to the print medium. The reader is invited to read under the glow of the CRT, letting digital strokes carry him or her from one corner of the world to another.

From the point of view of the artist, what is the Internet? Is it a virtual catalogue, or the most perfect gallery for electronic images? For some it may be an interactive medium. Yet others push interactivity beyond the screen and integrate it in hybrid contexts. Its ordinary use might suggest that it is more like the telephone and the postal systems, which basically enable the exchange of messages between distant interactors. The Internet incorporates certain aspects of television and radio by making it possible for individuals to broadcast messages to groups. Perhaps the most exciting feature of the Internet is that it is simultaneously all of the above and more. Without a governing body or directors that firmly control its content and development, the Internet can be approached from many angles, and it continues to grow and transform itself as you read your e-mail today.

Granted access to a graphical user interface and a link via modem or Ethernet, pointing and clicking is all that is needed to navigate the Internet. With simple key strokes one can go from one continent to another at remarkable speeds, even over a standard modem connection. As we find a topic of interest, we click on a word or picture, opening up connections to other words, pictures, and sites. The process is endless. However, in most cases the gestures of pointing and clicking do not constitute, by themselves, a significant element of the navigational experience. When looking at catalogues of traditional media works and galleries of electronic images, we point and click with the objective of arriving at the destination. The rhizomorphous structure of Web browsers facilitates the experience, but does not constitute in itself a key element in the production of meaning, since the still pictures are stored in a remote computer awaiting contemplation. As in a physical gallery, if we choose to look at one painting first instead of another, this choice in itself does not play a role in our appreciation of

the pictures themselves. In the case in point, some of the works available on the Internet do incorporate the hypermedia quality of user-friendly graphical interfaces such as Netscape. These works explore the Internet not as a gallery to show pictures, but as an interactive medium. These works are based on mutable structures and unstable links. For them to be meaningful, they rely on enabling the participant to make choices on-line, participate in the development of the work, and determine the experience one has as he or she navigates a given piece.

Literary works created in hypertext media do not have a correspondent in print and can exist both inside and outside the Internet, as long as they are translated from their original format (HyperCard and Storyspace, for example) to Html (hypertext mark-up language), the Web scripting language. Due to their intrinsic interactive character, when publicly displayed on the Net, hypertext pieces abolish the distinctions made hitherto between writing and publishing. These distinctions have been regularly attacked since the early '20s by poets such as E.E. Cummings, who embraced the typewriter as a medium by using it to produce himself the final visual structure of his poems, instead of leaving it up to the publisher and the typesetter. Cummings wrote with a typewriter, to compose with black and white spaces organized into horizontal and vertical grids. Hypertext authors write with software that enables non-hierarchical organization of information, which is absolutely suitable to the interactive interface currently pervading the Internet. Hyperfiction author Judy Malloy, a "pop conceptualist", in her own words, is now offering "l0ve0ne" (http://www.eastgate.com/-malloy/) through Eastgate's Web page (http://www.eastgate.com/eastgate/Minihome.htmi). Via e-mail she has defined 'l0ve0ne' as "a continuing narrative of comings and goings, German hacker artists, computer culture, hardware and software love gone wrong". As new screens are added, to read her piece is to browse the pages of Sarah's diary making conceptual links between them as this work-in-progress evolves on-line. As I click on the underlined words, I'm taken to multiple lexia that can exhibit small or large amounts of verbal material and take the visual form of narrative sentences or lines of verse.

By clicking on the underlined vowels of these words in the middle of a paragraph, among other opening-page choices, I'm trusted to another page, where I find more underlined words awaiting my choice:

It doesn't seem so long ago
that I was walking the streets of Washington, DC
wearing white gloves.
Those strange cotton hand coverings
were what the natives were wearing
even though it was August
and sweat soaked the armpits of my short black linen dress as I stood at the bus stop
clutching an envelope of laboriously hand typed resumes.

From Malloy's on-line hyperfiction to the "File Room" installation project (1994) by New York-based Spanish artist Antonio Muntadas (http://fileroom.aaup.uic.edu/FileRoom/documents/homepage.html), we see the transition from non-linear narrative to the use of a database as an element of cultural intervention. Muntadas's physical installations usually criticise institutions of cultural and political power. His "Board Room", from 1987, for example, consisted of tables and chairs that pointed to the corporate identity of organized religion. Thirteen photographs of television evangelists and religious leaders like Pope John II and Ayatollah Khomeni were displayed with small CRT's mounted on their mouths. Muntadas showed that public broadcasts that commercialize spiritual well being, retail private feelings, and promote holy wars are now made from comfortable private rooms. Political, religious, and communication control are one and the

same. Muntadas's "File Room" project, a collaboration with dozens of artists, curators, programmers and activists, gives continuity to his installation work, except that this time an Internet dynamic archive offers viewers Web access to information about the history of censorship and its repercussions. On the first floor of the Chicago Cultural Center, an environment was constructed with 138 black metal filing cabinets, low-hanging light fixtures, and seven computer monitors (linked to a central server). Viewers could access instances of censorship by geographical location, date, grounds for censorship or medium. Another computer at the center of the room enabled visitors to enter their own examples into the archive. The case of Uruguayan Mail and performance artist Clemente Padin (hftp://fileroom.aaup.uic.edu/FileRoom/ documents/Cases/38padinPerf.html), for example, who was incarcerated in 1975 for the crime of "vilification and mocking of the armed forces", is documented among many others.

The role of the Internet as a provider of voice and memory resonates against its opposite, censorship. This antagonism echoes contrasts between public and private, old function and new use, individual and collaborative work, and pervaded the physical installation presented in Chicago. Elisabeth Subrin, artist and research coordinator for the project explained its scope: "The File Room was produced by artists and, as such, does not presume the role of a library, or an encyclopedia, in the traditional sense. Instead, the project proposes alternative methods for information collection, processing and distribution, to stimulate dialogue and debate around issues of censorship and archiving" (http://fileroom.aaup.uic.edu/FileRoom/publication/subrin.html). The Web archive is still on-line and can be expanded by the remote reader.

While some institutions and individuals use the Net to share information about art as well as the art work itself, some artists experiment with interactive concepts on-line. Muntadas's installation invited viewers to explore a censorship archive in a Kafkaesque room, suggesting critical readings in regard to the building that hosted his exhibit, a library turned into a cultural center. The function of the book and the social role of the library are pressing issues in the age of information, and so is the complex relationship between the Internet and architecture. Some artists are expanding and hybridizing the Internet with other spaces, media, systems, and processes, exploring yet a new zone of experimentation.

Internet hybrids expose at once the decrepitude of unidirectional and highly centralized forms of distribution, such as television, and contribute to expanding communicative possibilities that are absolutely unique to this immaterial, unstable, telematic form of artistic action. Hybrids also allow artists to go beyond the creation of on-line pieces that conform to the emerging design and conceptual standards of the Internet, therefore evading what very often could seem repetitive solutions to design exercises. Away from the art market, a new international generation of media artists, often working in collaboration, exhibits the same utopian fury and radical innovation that once characterized the modern "avant-garde" groups. If we no longer call the innovative art of the present —"avant-garde" - we must still acknowledge the critical and experimental scope of their enterprise within and beyond the Internet despite (or because) of the fact that they don't fit into any of the "-isms" that serve as chapter heads to art history survey books.

One such group not waiting for the rest of the world to catch up is Ponton European Media Art Lab, founded in 1986, and based in Hamburg, Germany, since 1989. Composed of fifteen members but mobilizing twice as many people, according to the project, this independent group includes artists and technicians from Germany, Italy, France, Austria, Canada, and the US. Their most ambitious project to date was the interactive television event Piazza Virtuale

(Virtual Square), presented for 100 days as part of the quadrennial international art exhibition Documenta IX, in Kassel, Germany, in 1993. The project created an unprecedented communication hybrid of live television (based on two satellite feeds) and four lines for each of the following: ISDN, telephone voice, modem, touch-tone phone, videophone, and fax. There was no unidirectional transmission of programs as in ordinary television. With no pre-set rules or moderators, up to twenty viewers called, logged on, or dialed-up simultaneously, and started to interact with one another in the public space of television, occasionally controlling remote video cameras on a track in the studio's ceiling. All of the incoming activity from several countries was re-broadcast live from Ponton's Van Gogh TV site in Kassel, to all of Europe and occasionally to Japan, and North America. A pamphlet distributed in Kassel about the project announced that the Piazza Virtuale was "an image-symbolic language of interaction, of taking part — not the distanced naturalistic copy of the world, the aesthetic of the 19th century, which is often still created in electronic worlds of images".

This kind of work is deeply rooted in the idea that art has a social responsibility. The artists act on it directly, in the domain of mediascape and reality. Among other implications, this project takes away the monologic voice of television to convert it into another form of public space for interaction, analogous to the Internet Corporate-hyped ideas of "video-on-demand" or "interactive TV" are, even before implementation, already surpassed by the worldwide interactivity enabled by the Internet. In a statement posted on August of 1993, in the newsgroup comp.multimedia, Ponton's interface designer Ole Lntjens stated: "The Piazza Virtuale is a step forward for the media art of the future, in which interactive television and international networks can be an important collective form of expression" (http://www.ntt.jp/people/takada/mt/archive/infotalk/199308/19930830.html) .

Sharing the same concerns for the political resonance of hierarchical mediascapes, and the socio-aesthetic possibilities of recombined and hybridized electronic media, since 1989 I have been working with Ed Bennett in the Ornitorrinco project of telepresence installations. Ornitorrinco means platypus, in Portuguese, an animal popularly thought of as a "hybrid" of

bird and mammal. Originally conceived in 1987, this work dramatically expands on my early telecommunication pieces, created after 1985, in Brazil, with the nationally adopted (and now abandoned) French videotext system. The concept of telepresence, which I introduced in art in my 1990 article "Ornitorrinco: Exploring telepresence and remote sensing"(http://www.uky.edu/Artsource/kac/kac.html), has been widely used in the scientific community since the early '80s. It references emerging remote control scenarios, in which a person guides a telerobot from afar and receives visual feedback, thus gaining a sense of presence in the remote environment.

The basic structure of the Ornitorrinco series of telepresence installations is comprised of the wireless telerobot itself, regular phone lines (both for vision and remote control), and remote spaces. Viewers become participants as they transport themselves to the remote body and navigate the remote space freely by pressing the keys on a familiar telephone. Ornitorrinco remote spaces are always built to the scale of the telerobot, inviting viewers to abandon the human scale temporarily and to look at a new world from a perspective other than their own. "Ornitorrinco in Copacabana", our first public telepresence art event was presented at the Siggraph Art Show, in Chicago, in 1992. "Ornitorrinco on the Moon" was presented between The School of the Art Institute (Chicago) and the Künstlerhaus (Graz, Austria), in 1993. Both were point-to-point events. In our most recent international telepresence event, Ornitorrinco in Eden, realized on October 23, 1994, we hybridized the Internet with telerobotics, physical (architectural) spaces, the telephone system, the parallel cellular system, and a revised if literal digital "tele-vision". This enabled participants to decide by themselves where they went and what they saw in a physical remote space via the Internet. Anonymous participants shared the body of the telerobot, controlling it and looking through its eye simultaneously. A new aesthetic is emerging as a result of the synergy of new non-formal elements, such as co-existence in virtual and real spaces, synchronism of actions, real-time remote control, operation of telerobots, and collaboration through networks. The telepresence installation Ornitorrinco in Eden integrated all these elements (http://www.uky.edu/Artsource/kac/kac.html).

The networked telepresence installation Ornitorrinco in Eden bridged the placeless space of the Internet with physical spaces in Seattle, WA, Chicago, IL, and Lexington, KY. The piece consisted of three nodes of active participation and multiple nodes of observation worldwide. Anonymous viewers from several American cities and many countries (including Finland, Canada, Germany, and Ireland) came on-line and were able to experience the remote installation in Chicago from the point of view of Ornitorrinco (which was guided by anonymous participants in Lexington and Seattle).

The mobile and wireless telerobot Ornitorrinco in Chicago was controlled in real time by participants in Lexington and Seattle. The remote participants shared the body of Ornitorrinco simultaneously. Via the Internet, they saw the remote installation through Ornitorrinco's eye. The participants controlled the telerobot simultaneously via a regular telephone fink (three-way conference call) in real-time.

The space of the installation was divided into three sectors, which were all interconnected. The predominant visual theme was the obsolescence of media once perceived as innovative and the presence of these media in our technological landscape. Obsolete records, magnetic tapes, circuit boards, and other elements were used primarily for their external shape, texture, and scale, rather than function. Theatrical lights were also used to enhance the visual experience and to control the projection of shadows in specific areas of the installation. Small objects were placed in strategic points in the space, including plastic globes that were actually

pushed around by the telerobot,which was a self-propelled circular object which hung from the ceiling and moved in unpredictable ways - a little stationary robot with glowing eyes which, upon close scrutiny, revealed itself as a swiveling fan, and a mirror which enabled participants to "see themselves" as the telerobot Ornitorrinco. Objects like these provided the viewer with surprise encounters along the path of their exploration of the space and helped convey the atmosphere suggested by this teleparadise of obsolescence.

Art historian and curator Keith Holz stated that Ornitorrinco in Eden prompts "reflection upon one's status as an active member of an imaginary technologically constituted — community. "Through the creation of simple and complex hybrids of existing communication technologies," he continued, "this work demystifies its conventional operations and arrangements, and encourages participants to consider how the slippages and gaps between discretely conceived media, when modulated together, might offer emancipatory alternatives to such codified usages typified by unidirectional media forms as television" (http://www-mitpress.mit-edu/LEA/BackIssues/Lea2-12.txt).

In the new interactive and participatory context generated by this networked telepresence installation realized over the Internet, communicative encounters took place not through verbal or oral exchange but through the rhythms that resulted from the participants' engagement in a shared mediated experience. Viewers and participants were invited to experience together, in the same body, an invented remote space from a perspective other than their own, temporarily lifting the ground of identity, geographic location, physical presence, and cultural bias. As the piece was experienced through the Internet anybody in the world with Internet access could see it, dissolving gallery walls and making the work accessible to larger audiences.

By merging telerobotics, remote participation, geographically-dispersed spaces, the traditional telephone system as well as cellular telephones, real-time motion control and videoconferencing through the internet, this networked telepresence installation produced a new form of interactive experience which, in consonance with Ponton's work, points to future forms of art. If, in the next century, mass media's unidirectional discourse will renew its structure and its reach through pseudo-interactive gadgets, it is clear that more and more people will live, interact and work between the worlds inside and outside computer networks. As a result of the expansion of communication and telepresence technologies, new forms of interface between humans, plants, animals, and robots will be developed. This work is taking a critical step in this direction.

With new wearable computers, portable satellite dishes, wristphones, holographic video, and a whole plethora of new technological inventions, telecommunications media will continue to proliferate, but by no means can this be seen as an assurance of a qualitative leap in interpersonal communications. Ornitorrinco in Eden created a context in which anonymous participants perceived that R was only available through their shared experience and non-hierarchical collaboration and that, 1ittle by 1ittle, or almost frame by frame, a new reality was constructed, In this new reality, spatiotemporal distances became irrelevant, virtual and real spaces became equivalent and linguistic barriers were temporarily removed in favor of a common empowering experience.

Undoubtedly, the Internet represents a new challenge for art. It highlights the immaterial and underscores cultural propositions, placing the aesthetic debate at the core of social transformations. Unique to postmodernism, it also offers a practical model of decentralized knowledge and power structures, challenging contemporary paradigms of behavior and

discourse. The wonderful cultural elements it brings will continue to change our lives beyond the unidirectional structures that currently give shape to the mediascape. As participants in a new phase of social change, facing international conflicts and domestic disputes, we must not lose sight of the dual stand of the Internet. If dominated by corporate agendas it could become another form of delivery of information parallel to television and radio, forcing "netizens" (i.e., the world, virtually) to conform to rigid patterns of interaction. Commercial imperatives could continue to prevent the Net from expanding in underdeveloped zones, such as South America and Africa. The Internet also exhibits the risk of making all cultural artifacts look the same, with virtual surfaces, standard interfaces, and regulated forms of communication.

Emerging forms of Internet communication point to a more progressive direction, however. Internet telephony, for example, is already enabling Macintosh (http://www.emagic.com/) and PC (http://www.vocaltec.com) users alike to "talk on the phone" with any other computer user with Net access in the world. All that is needed is an IP address (which all users have, or obtain as they log on), a microphone, and speakers (or headphones). The IP address replaces the old phone number. While still incipient, this technology could challenge telephonic regulations, enabling more individuals to speak with one another at no cost, and promoting new social relationships.

The Internet has come a long way from the original small-scale network based on a command-line interface, It is clear that the future of art and the future of the Internet will be intertwined. What the Internet itself will become, and what new art forms will emerge, are questions that must continually be addressed in the present.